AIR QUALITY ASSESSMENT

Sol Orchard- Valley Center Solar Project
MUP 3300-11-027
Environmental Log Number 3910 11-08-010
APN 188-290-20-00

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EXECUTIVE SUMMARY

This air quality analysis has been completed to determine impacts, which may be associated with the construction and operation of the proposed Sol Orchard - Valley Center Solar Project. The Project would consist of clearing and minor grading 46 of 55 acres and then installing self tracking solar panels. The Project is located in the unincorporated community of Valley Center in northern portion of San Diego County, CA. All phases of the proposed project are anticipated to be completed late 2012.

During construction, the proposed project will produce fugitive dust and diesel particulate matter, Reactive Organic Gases, Oxides of Nitrogen, Carbon Monoxide and Sulfur Dioxide, however, only construction related PM10 without mitigation would be expected to exceed PM10 thresholds established by the County of San Diego. Implementation of mitigation activities described below will reduce construction emissions to below significance:

1. *Apply water during grading/grubbing activities to all active disturbed areas and onsite roadways at least twice daily.*

Furthermore, a screening-level health risk assessment was conducted to determine the potential for the project to result in a significant impact on nearby sensitive receptors during short-term construction activities. For purposes of this analysis, the primary pollutant of concern is diesel particulate matter (DPM) which is emitted by the operation of heavy diesel equipment during construction activities. The result of the health risk assessment indicates that the proposed project could result in a health risk impact to either existing or future sensitive receptors should sensitive receptors be at or around 323 Meters from the geometric center of the project. This potential impact can be mitigated through the use of T-BACT equipment or equipment such as diesel particulate filters, catalytic converters and or a combination of DPM reducing equipment and selective emission reduction fuels. Therefore no health risk impacts are anticipated.

Cumulative impacts are not expected due to the fact that nearby construction projects would not concurrently be constructed. Also, given the fact that the proposed project is expected to reduce ozone precursors given it is a renewable non combustive energy project, the project would be expected to comply with the County's Regional Air Quality Strategy.

Operations of the project would involve washing the panels and various maintenance activities onsite. These operations can generate dust onsite from onsite service roads. Therefore, the project would install permeable rock on all access roads to reduce dust. A worst case trip generation would be less than 25 daily trips and would only occur at this intensity during PV system maintenance. Therefore, Operational emissions would not be expected to exceed county screening thresholds.

Finally, the proposed Project would not be expected have a potential to create offensive odors to any substantial number of sensitive receptors given the project will not create such odors.

1.0 INTRODUCTION

1.1 Purpose of this Study

The purpose of this Air Quality study is to determine potential air quality impacts (if any) that may be created during the construction of a photovoltaic solar farm to be constructed in the town of Valley Center located in eastern San Diego County. Should impacts be determined, the intent of this study would be to recommend suitable mitigation measures, which would reduce those impacts to levels that are less than significant. Daily operations of the project will be primarily from maintenance and worker trips, although some emissions are expected, they would be minimal and below the screening level thresholds within the San Diego County Guidelines for Determining Significance.

1.2 Project Location

The Project is located within the in the town of Valley Center in the unincorporated County of San Diego. The Project is located at 33° 14.020' N and 117° 0.417' W, between Valley Center Road and Vesper Road located within the County of San Diego. The general location of the Project is shown on the Vicinity Map in Figure 1-A on Page 3 of this report.

1.3 Project Description

The Project proponent is preparing an application for development and operation of a photovoltaic (PV) solar farm to be located on privately-held lands near Valley Center. The Project would require approval from the County of San Diego for a Major Use Permit (MUP) to allow for the construction, operation, and maintenance of such facilities for the long-term generation of solar energy. The proposed facilities would have an overall production capacity of 7.5 Megawatts (MW) (alternating current – AC). The Project is expected to supply roughly 30-90 percent of power delivered to the Valley Center area, depending on the time of day. No export to transmission is anticipated.

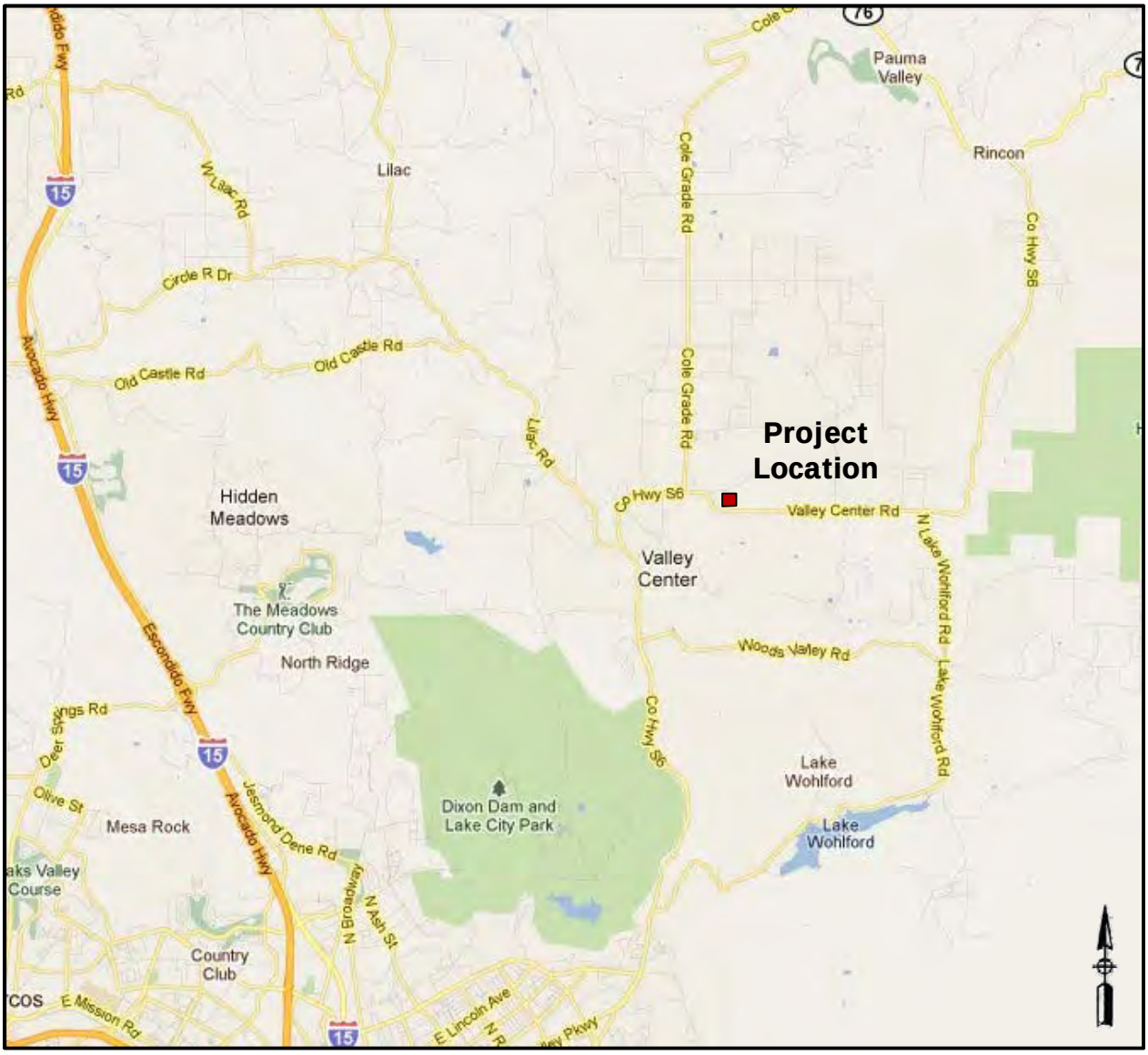
The proposed PV solar facilities would be installed on a portion of an approximately 55-acre parcel, under the ownership of the Project applicant, to achieve the intended MW output; however, development and MUP authority would be limited to

approximately 46 acres of the parcel, allowing the unaffected acreage to generally remain in its present state (single-family residential use with supporting outbuildings, with exception of removal of an existing mobile home). The Project design would consist of a series of single-axis tracking photovoltaic solar panels supported on a galvanized driven H-pile post system. In isolated cases where geotechnical constraints are encountered, a ballast foundation system would be provided. The panels would be made of monocrystalline or polycrystalline material.

The solar panels would be aligned in rows and would face to the east in the morning and to the west in the evening hours, tracking the sun along the vertical axis to maximize solar absorption during the hours of daylight. The panels would be rack-mounted in a three-panel system, measuring approximately eight feet from the ground surface to the top of panel on flat surfaces and a maximum of 11.5 feet on sloped surfaces. As the height of the proposed PV solar panels would range from approximately 8-11.5 feet as measured from ground surface, the solar panels would not represent elements of large scale or height within the existing landscape. The length of each row of panels would be approximately 300 feet along the north/south axis. The ultimate arrangement/number of PV solar panels, racking, inverter pads and structures, and internal access are shown in on the MUP Plot Plan to illustrate the general configuration of the proposed solar collection system; however, this layout is subject to modification at final engineering design.

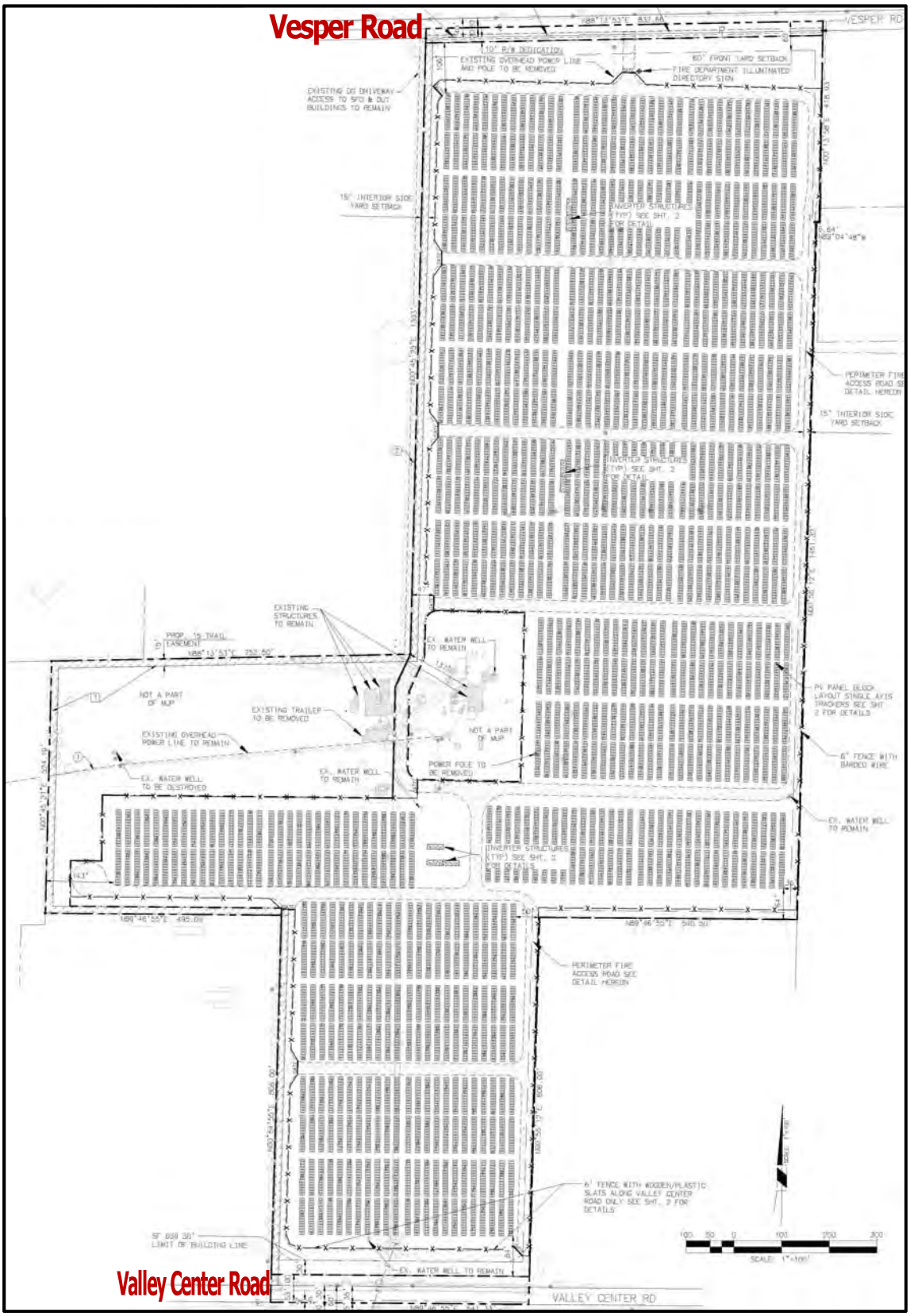
Energy generated by the Project would be delivered to an existing 12 kV distribution line that runs parallel to Valley Center Road. Connection would be made from the Project site either via trench under Valley Center Road. The site plans for the proposed project configuration used for this analysis is shown on Figure 1-B on Page 4 of this report.

Figure 1-A: Project Vicinity Map



Source: Google Maps, 7/11

Figure 1-B: Proposed Project Site Layout



Source: RBF Consulting 7-20-2011

2.0 EXISTING ENVIRONMENTAL SETTING

2.1 Existing Setting

The 55-acre project site (APN#188-290-20) is located at 15155 Vesper Road in Valley Center within the County of San Diego. The site is comprised of mostly vacant land however there are residential uses onsite. The proposed PV project would not include roughly 6.61 acres of the project site, which will remain residential. Topography onsite is generally flat with elevations for most of the site at 1,440 feet above mean seal level.

2.2 Climate and Meteorology

Climate within the San Diego Air Basin SDAB area often varies dramatically over short geographical distances due to the size and topography. Most of southern California is dominated by high-pressure systems for much of the year, which keeps the desert mostly sunny and warm. Typically, during the winter months, the high pressure system drops to the south and brings cooler, moister weather from the north.

It is common for inversion layers to develop within high-pressure areas, which mostly define pressure patterns over the SDAB. These inversions are caused when a thin layer of the atmosphere increases in temperature with height. An inversion acts like a lid preventing vertical mixing of air through convective overturning. Average temperatures in alpine range from about 55 in the winter to about 75 degrees in the summer (Source: http://www.city-data.com/city/Valley-Center-California.html)

2.3 Regulatory Standards

2.3.1 Federal Standards and Definitions

The Federal Air Quality Standards were developed per the requirements of The Federal Clean Air Act, which is a federal law that was passed in 1970 and amended in 1990. This law provides the basis for the national air pollution control effort. An important element of the act included the development of national ambient air quality standards (NAAQS) for major air pollutants.

The Clean Air Act established two types of air quality standards otherwise known as primary and secondary standards. ***Primary Standards*** set limits for the intention of protecting public health, which includes sensitive populations such as asthmatics, children and elderly. ***Secondary Standards*** set limits to protect public welfare to include protection against decreased visibility, damage to animals, crops, vegetation and buildings.

The Environmental Protection Agency (EPA) Office of Air Quality Planning and Standards (OAQPS) has set National Ambient Air Quality Standards for principal pollutants, which are called "criteria" pollutants. These pollutants are defined below:

1. ***Carbon Monoxide (CO):*** *is a colorless, odorless, and tasteless gas and is produced from the partial combustion of carbon-containing compounds, notably in internal-combustion engines. CO usually forms when there is a reduced availability of oxygen present during the combustion process. Exposure to CO near the levels of the ambient air quality standards can lead to fatigue, headaches, confusion, and dizziness. CO interferes with the blood's ability to carry oxygen.*
2. ***Lead (Pb):*** *is a potent neurotoxin that accumulates in soft tissues and bone over time. The major sources of lead emissions have historically been motor vehicles (such as cars and trucks) and industrial sources. Because lead is only slowly excreted, exposures to small amounts of lead from a variety of sources can accumulate to harmful levels. Effects from inhalation of lead near the level of the ambient air quality standard include impaired blood formation and nerve conduction. Lead can adversely affect the nervous, reproductive, digestive, immune, and blood-forming systems. Symptoms can include fatigue, anxiety, short-term memory loss, depression, weakness in the extremities, and learning disabilities in children.*
3. ***Nitrogen Dioxide (NO_2):*** *is a reactive, oxidizing gas capable of damaging cells lining the respiratory tract and is one of the nitrogen oxides emitted from high-temperature combustion, such as those occurring in trucks, cars, power plants, home heaters, and gas stoves. In the presence of other air contaminants, NO_2 is usually visible as a reddish-brown air layer over urban areas. NO_2 along with other traffic-related pollutants is associated with respiratory symptoms, respiratory illness and respiratory impairment. Studies in animals have reported biochemical, structural, and cellular changes in the lung when exposed to NO_2 above the level of the current state air quality standard. Clinical studies of human subjects suggest that NO_2 exposure to levels near the current standard may worsen the effect of allergens in allergic asthmatics, especially in children.*
4. ***Particulate Matter (PM_{10} or $PM_{2.5}$):*** *is a complex mixture of tiny particles that consists of dry solid fragments, solid cores with liquid coatings, and small droplets of liquid. These particles vary in shape, size and chemical composition, and can be made up of multiple materials such as metal, soot, soil, and dust. PM_{10} particles are 10 microns (µm) or less and $PM_{2.5}$ particles are 2.5 (µm) or less. These particles can contribute significantly to regional haze and reduction of visibility in*

California. Exposure to PM levels exceeding current air quality standards increases the risk of allergies such as asthma and respiratory illness.

5. ***Ozone (O_3)**: is a highly oxidative unstable gas capable of damaging the linings of the respiratory tract. This pollutant forms in the atmosphere through reactions between chemicals directly emitted from vehicles, industrial plants, and many other sources. Exposure to ozone above ambient air quality standards can lead to human health effects such as lung inflammation, tissue damage and impaired lung functioning. Ozone can also damage materials such as rubber, fabrics and plastics.*

6. ***Sulfur Dioxide (SO_2)**: is a gaseous compound of sulfur and oxygen and is formed when sulfur-containing fuel is burned by mobile sources, such as locomotives, ships, and off-road diesel equipment. SO_2 is also emitted from several industrial processes, such as petroleum refining and metal processing. Effects from SO_2 exposures at levels near the one-hour standard include bronchoconstriction accompanied by symptoms, which may include wheezing, shortness of breath and chest tightness, especially during exercise or physical activity. Children, the elderly, and people with asthma, cardiovascular disease or chronic lung disease (such as bronchitis or emphysema) are most susceptible to these symptoms.*

2.3.2 State Standards and Definitions

The State of California Air Resources Board (ARB) sets the laws and regulations for air quality on the state level. The California Ambient Air Quality Standards (CAAQS) are either the same as or more restrictive then the NAAQS and also restrict four additional contaminants. Table 2.1 on the following page identifies both the NAAQS and CAAQS. The additional contaminants as regulated by the CAAQS are defined below:

1. ***Visibility Reducing Particles**: particles in the air that obstruct visibility.*

2. ***Sulfates**: are salts of Sulfuric Acid. Sulfates occur as microscopic particles (aerosols) resulting from fossil fuel and biomass combustion. They increase the acidity of the atmosphere and form acid rain.*

3. ***Hydrogen Sulfide (H_2S)**: is a colorless, toxic and flammable gas with a recognizable smell of rotten eggs or flatulence. H_2S occurs naturally in crude petroleum, natural gas, volcanic gases, and hot springs. Usually, H_2S is formed from bacterial breakdown of organic matter. Exposure to low concentrations of hydrogen sulfide may cause irritation to the eyes, nose, or throat. It may also cause difficulty in breathing for some asthmatics. Brief exposures to high concentrations of hydrogen sulfide (greater than 500 ppm) can cause a loss of consciousness and possibly death.*

4. ***Vinyl Chloride**: is also known as chloroethene and is a toxic, carcinogenic, colorless gas with a sweet odor. It is an industrial chemical mainly used to produce its polymer, polyvinyl chloride (PVC).*

Table 2.1: Ambient Air Quality Standards

Ambient Air Quality Standards						
Pollutant	Average Time	California Standards[1]		Federal Standards[2]		
		Concentration[3]	Method[4]	Primary[3,5]	Secondary[3,6]	Method[7]
Ozone (O_3)	1 Hour	0.09 ppm (180 µg/m3)	Ultraviolet Photometry	-	Same as Primary Standard	Ultraviolet Photometry
	8 Hour	0.070 ppm (137 µg/m3)		0.075 ppm (147 µg/m3)		
Respirable Particulate Matter (PM10)	24 Hour	50 µg/m3	Gravimetric or Beta Attenuation	150 µg/m3	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	20 µg/m3		-		
Fine Particulate Matter PM2.5	24 Hour	No Separate State Standard		35 µg/m3	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	12 µg/m3	Gravimetric or Beta Attenuation	15 µg/m3		
Carbon Monoxide (CO)	8 hour	9.0 ppm (10mg/m3)	Non-Dispersive Infrared Photometry (NDIR)	9 ppm (10 mg/m3)	None	Non-Dispersive Infrared Photometry
	1 hour	20 ppm (23 mg/m3)		35 ppm (40 mg/m3)		
	8 Hour (Lake Tahoe)	6 ppm (7 mg/m3)		-	-	-
Nitrogen Dioxide (NO_2)	Annual Arithmetic Mean	0.030 ppm (57 µg/m3)	Gas Phase Chemiluminescence	0.053 ppm (100 µg/m3)[8]	Same as Primary Standard	Gas Phase Chemiluminescence
	1 Hour	0.18 ppm (339 µg/m3)		0.100 ppm[8]	None	
Sulfur Dioxide (SO_2)	24 Hour	0.04 ppm (105 µg/m3)	Ultraviolet Fluorescence	-	-	Ultraviolet Flourescence; Spectrophotometry (Pararoosaniline Method)[9]
	3 Hour	-		-	0.5 ppm (1300 µg/m3)	
	1 Hour	0.25 ppm (655 µg/m3)		75 ppb (196 µg/m3) (See Footnote 9)	-	
Lead[10]	30 Day Average	1.5 µg/m3	Atomic Absorption	-	Same as Primary Standard	-
	Calendar Quarter			1.5 µg/m3		High Volume Sampler and Atomic Absorption
	Rolling 3-Month Average			0.15 µg/m3		
Visibility Reducing Particles	8 Hour	Extinction coefficient of 0.23 per kilometer - visibility of ten miles or more (0.07 -30 miles or more for Lake Tahoe) due to particles when relative humidity is less than 70 percent. Method: Beta Attenuation and Transmittance through Filter Tape				
Sulfates	24 Hour	25 µg/m3	Ion Chromatography			
Hydrogen Sulfide	1 Hour	0.03 ppm (42 µg/m3)	Ultraviolet Fluorescence			
Vinyl Chloride[10]	24 Hour	0.01 ppm (26 µg/m3)	Gas Chromatography			

1. California standards for ozone, carbon monoxide (except Lake Tahoe), sulfur dioxide (1 and 24 hour), nitrogen dioxide, suspended particulate matter—PM10, PM2.5, and visibility reducing articles, are values that are not to be exceeded. All others are not to be equaled or exceeded. California ambient air quality standards are listed in the Table of Standards in Section 70200 of Title 17 of the California Code of Regulations.
2. National standards (other than ozone, particulate matter, and those based on annual averages or annual arithmetic mean) are not to be exceeded more than once a year. The ozone standard is attained when the fourth highest eight hour concentration in a year, averaged over three years, is equal to or less than the standard. For PM10, the 24 hour standard is attained when the expected number of days per calendar year with a 24-hour average concentration above 150 µg/m3 is equal to or less than one. For PM2.5, the 24 hour standard is attained when 98 percent of the daily concentrations, averaged over three years, are equal to or less than the standard. Contact U.S. EPA for further clarification and current federal policies.
3. Concentration expressed first in units in which it was promulgated. Equivalent units given in parentheses are based upon a reference temperature of 25°C and a reference pressure of 760 torr. Most measurements of air quality are to be corrected to a reference temperature of 25°C and a reference pressure of 760 torr; ppm in this table refers to ppm by volume, or micromoles of pollutant per mole of gas.
4. Any equivalent procedure which can be shown to the satisfaction of the ARB to give equivalent results at or near the level of the air quality standard may be used.
5. National Primary Standards: The levels of air quality necessary, with an adequate margin of safety to protect the public health.
6. National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.
7. Reference method as described by the EPA. An “equivalent method” of measurement may be used but must have a “consistent relationship to the reference method” and must be approved by the EPA.
8. To attain this standard, the 3-year average of the 98th percentile of the daily maximum 1-hour average at each monitor within an area must not exceed 0.100 ppm (effective January 22, 2010). Note that the EPA standards are in units of parts per billion (ppb). California standards are in units of parts per million (ppm). To directly compare the national standards to the California standards the units can be converted from ppb to ppm. In this case, the national standards of 53 ppb and 100 ppb are identical to 0.053 ppm and 0.100 ppm, respectively.
9. On June 2, 2010, the U.S. EPA established a new 1-hour SO2 standard, effective August 23, 2010, which is based on the 3-year average of the annual 99th percentile of 1-hour daily maximum concentrations. EPA also proposed a new automated Federal Reference Method (FRM) using ultraviolet technology, but will retain the older pararosaniline methods until the new FRM have adequately permeated State monitoring networks. The EPA also revoked both the existing 24-hour SO2 standard of 0.14 ppm and the annual primary SO2 standard of 0.030 ppm, effective August 23, 2010. The secondary SO2 standard was not revised at that time; however, the secondary standard is undergoing a separate review by EPA. Note that the new standard is in units of parts per billion (ppb). California standards are in units of parts per million (ppm). To directly compare the new primary national standard to the California standard the units can be converted to ppm. In this case, the national standard of 75 ppb is identical to 0.075 ppm.
10. The ARB has identified lead and vinyl chloride as 'toxic air contaminants' with no threshold level of exposure for adverse health effects determined. These actions allow for the implementation of control measures at levels below the ambient concentrations specified for these pollutants.
11. National lead standard, rolling 3-month average: final rule signed October 15, 2008.

Source: California Air Resources Board (9/8/10)

2.3.3 Regional Standards

The State of California has 35 specific air districts, which are each responsible for ensuring that the criteria pollutants are below the NAAQS and CAAQS. Air basins that exceed either the NAAQS or the CAAQS for any criteria pollutants are designated as "non-attainment areas" for that pollutant. Currently, there are 15 non-attainment areas for the federal ozone standard and two non-attainment areas for the $PM_{2.5}$ standard. The state therefore created the California State Implementation Plan (SIP), which is designed to provide control measures needed for California Air basis to attain ambient air quality standards.

The San Diego Air Pollution Control District (SDAPCD) is the government agency which regulates sources of air pollution within San Diego County. Therefore, the SDAPCD developed a Regional Air Quality Strategy (RAQS) to provide control measures to try to achieve attainment status. Currently, San Diego is in "non-attainment" status for federal O_3 and the State PM_{10} and $PM_{2.5}$ however, an attainment plan is only available of O_3. The RAQS was adopted in 1992 and has been updated as recently as 2009 which was the latest update incorporating minor changes to the prior 2004 update.

The 2009 update mostly clarifies and enhances emission reductions by implementing new VOC and NOX reduction measures. The criteria pollutant standards are generally attained when each monitor within the region has had no exceedances during the previous three calendar years. A complete listing of the current attainment status with respect to both federal and state nonattainment status by pollutants for San Diego County is shown in Table 2.2 on the following page.

Table 2.2: San Diego County Air Basin Attainment Status by Pollutant

San Diego County Air Basin Attainment Status by Pollutant			
Pollutant	Average Time	California Standards	Federal Standards
Ozone (O_3)	1 Hour	Non-attainment	No Federal Standard
	8 Hour		Basic Non-attainment
Respirable Particulate Matter (PM10)	Annual Arithmetic Mean	Non-attainment	No Federal Standard
	24 Hour	Non-attainment	Unclassified[1]
	Annual Arithmetic Mean	No State Standard	Unclassified[2]
Fine Particulate Matter PM2.5	24 Hour	No State Standard	Attainment
	Annual Arithmetic Mean	Non-attainment	Attainment
Carbon Monoxide (CO)	8 hour	Attainment	Maintenance Area[3]
	1 hour		
Nitrogen Dioxide (NO_2)	Annual Arithmetic Mean	No State Standard	Attainment
	1 Hour	Attainment	No Federal Standard
Sulfur Dioxide (SO_2)	Annual Arithmetic Mean	No State Standard	Attainment
	24 Hour	Attainment	Attainment
	1 Hour	Attainment	No Federal Standard
Lead	30 Day Average	Attainment	No Federal Standard
	Calendar Quarter	No State Standard	Attainment
Visibility Reducing Particles	8 Hour (10AM to 6PM, PST)	Unclassified	No Federal Standard
Sulfates	24 Hour	Attainment	No Federal Standard
Hydrogen Sulfide	1 Hour	Unclassified	No Federal Standard

1. Data reflects status as of March 19, 2009.

2. Unclassified; indicates data are not sufficient for determining attainment or nonattainment.

3. Maintenance Area (defined by U.S. Department of Transportation) is any geographic region of the United States previously designated nonattainment pursuant to the CAA Amendments of 1990 and subsequently redesignated to attainment subject to the requirement to develop a maintenance plan under section 175A of the CAA, as amended.

2.4 California Environmental Quality Act (CEQA) Significance Thresholds

The California Environmental Quality Act has provided a checklist to identify the significance of air quality impacts. These guidelines are found in Appendix G of the CEQA guidelines and are as follows:

AIR QUALITY -- Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. Would the project:

A: Conflict with or obstruct implementation of the San Diego Regional Air Quality Strategy (RAQS) or applicable portions of the State Implementation Plan (SIP)?

B: Result in emissions that would violate any air quality standard or contribute substantially to an existing or projected air quality violation?

C: Result in a cumulatively considerable net increase of any criteria pollutant for which the Project region is non-attainment under an applicable Federal or State ambient air quality standard (PM10, PM2.5 or exceed quantitative thresholds for O3 precursors, oxides of nitrogen [NOX] and Volatile Organic Compounds [VOCs])?

D: Expose sensitive receptors (including, but not limited to, schools, hospitals, resident care facilities, or day-care centers) to substantial pollutant concentrations?

E: Create objectionable odors affecting a substantial number of people?

2.5 SDAPCD - Air Quality Impact Assessment Screening Thresholds

The SDAPCD has established thresholds in Rule 20.2 (NON - MAJOR STATIONARY SOURCES) for the preparation of Air Quality Impact Assessments (AQIA). These screening criteria can be used to demonstrate that a project's total emissions would not result in a significant impact as defined by CEQA. Since SDAPCD does not have AQIA threshold for emissions of Volatile Organic Compounds (VOCs), the use of the threshold for VOCs from the South Coast Air Quality Management District for the Coachella Valley is used. Should emissions be found to exceed these thresholds, additional modeling is required to demonstrate that the project's total air quality impacts are below the state and federal ambient air quality standards. These screening thresholds for construction and daily operations are shown in Table 2.3 on the following page.

Non Criteria pollutants such as Hazardous Air Pollutants (HAPs) or Toxic Air Contaminants (TACs) are also regulated by the SDAPCD. Rule 1200 (Toxic Air Contaminants - New Source Review) adopted on June 12, 1996, requires evaluation of potential health risks for any new, relocated, or modified emission unit which may increase emissions of one or more toxic air contaminants. The rule requires that projects that propose to increase cancer risk to between 1 and 10 in one million need to implement toxics best available control technology (T-BACT) or impose the

most effective emission limitation, emission control device or control technique to reduce the cancer risk. At no time shall the project increase the cancer risk to over 10 in one million. Projects creating cancer risks less than one in one million are not required to implement T-BACT technology.

Table 2.3: Screening Threshold for Criteria Pollutants

Pollutant	Total Emissions (Pounds per Day)
Construction Emissions	
Respirable Particulate Matter (PM_{10} and $PM_{2.5}$)	100 and 55
Nitrogen Oxide (NO_x)	250
Sulfur Oxide (SO_x)	250
Carbon Monoxide (CO)	550
Volatile Organic Compounds (VOCs)	75
Reactive Organic Gases (ROG) SCAQMD	75
Operational Emissions	
Respirable Particulate Matter (PM_{10} and $PM_{2.5}$)	100 and 55
Nitrogen Oxide (NO_x)	250
Sulfur Oxide (SO_x)	250
Carbon Monoxide (CO)	550
Lead and Lead Compounds	3.2
Volatile Organic Compounds (VOCs)	75
Reactive Organic Gases (ROG) SCAQMD	75

The U.S. Environmental Protection Agency (U.S. EPA) uses the term Volatile Organic Compounds (VOC) and the California Air Resources Board's (CARB's) Emission Inventory Branch (EIB) uses the term Reactive Organic Gases (ROG) to essentially define the same thing. There are minor deviations between compounds that define each term however for purposes of this study we will assume they are essentially the same due to the fact SCAQMD interchanges these words and because URBEMIS2007 directly calculates ROG in place of VOC.

The County of San Diego requires reports to demonstrate compliance with these thresholds and show compliance under CEQA with respect to the environmental questions in Section 2.4 of this report.

2.6 Local Air Quality

Criteria pollutants are measured continuously throughout the San Diego Air Basin. This data is used to track ambient air quality patterns throughout the County. As mentioned earlier, this data is also used to determine attainment status when compared to the NAAQS and CAAQS.

The SDAPCD is responsible for monitoring and reporting monitoring data. The District operates 10 monitoring sites, which collect data on criteria pollutants. Four additional sites collect meteorological data, which is used by the District to assist with pollutant forecasting, data analysis and characterization of pollutant transport. Figure 2-A on the following page shows the relative locations of the monitoring sites.

SDAPCD published the five year air quality summary for all of the monitoring stations within the San Diego air basin (Source: http://www.arb.ca.gov/adam/topfour/topfourdisplay.php). The proposed development project is closest to the Escondido monitoring station which is approximately 8.5 miles away. Table 2.4 below identifies the criteria pollutants monitored at the aforementioned station.

FIGURE 2–A: Ambient Air Quality Monitoring Stations within SDAB – CARB

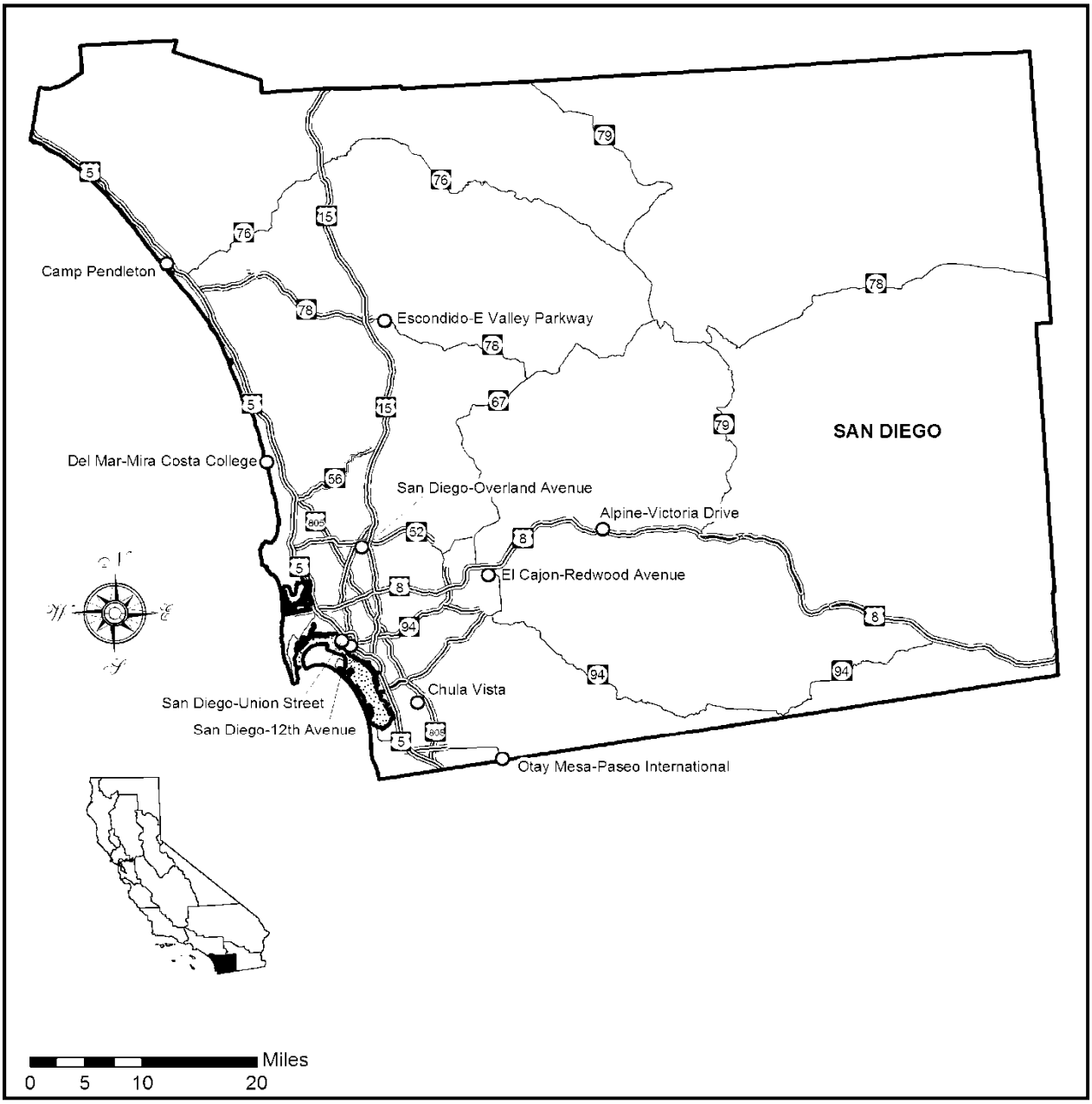


Table 2.4: Three-Year Ambient Air Quality Summary near the Project Site

Pollutant	Closest Recorded Ambient Monitoring Site	Averaging Time	CAAQS	NAAQS	2008	2009	2010
O3 (ppm)	Escondido-E Valley Parkway	1 Hour	0.09 ppm	-	0.16	0.093	0.105
	Escondido-E Valley Parkway	8 Hour	0.070 ppm	0.075 ppm	0.098	0.080	0.84
PM10 (µg/m3)	Escondido-E Valley Parkway	24 Hour	50 µg/m3	150 µg/m3	82	74	43
	Escondido-E Valley Parkway	Annual Arithmetic Mean	20 µg/m3	-	24.6	24.9	20.9
PM2.5 (µg/m3)	Escondido-E Valley Parkway	24 Hour	-	35 µg/m3	44	78.3	48.4
	Escondido-E Valley Parkway	Annual Arithmetic Mean	12 µg/m3	15 µg/m3	12.4	13.4	12.2
NO2 (ppm)	Escondido-E Valley Parkway	Annual Arithmetic Mean	0.030 ppm	0.053 ppm	0.018	0.016	0.014
	Escondido-E Valley Parkway	1 Hour	0.18 ppm	-	0.081	0.073	0.064
CO (ppm)	Escondido-E Valley Parkway	8 Hour	9 ppm	9 ppm	2.81	3.24	2.46

3.0 METHODOLOGY

3.1 Construction Emissions Calculations

Air quality impacts related to construction will be calculated using the latest URBEMIS2007 air quality model, which was developed by the California Air Resource Board (CARB). URBEMIS2007 has been approved by SDAPCD and the County of San Diego for construction emission calculations. URBEMIS incorporates emission factors from the EMFAC2007 model for on-road vehicle emissions and the OFFROAD2007 model for off-road vehicle emissions. The URBEMIS input/output model is shown in ***Attachment A*** at the end of this report.

Cancer Risk will be determined for Diesel Particulate Matter (DPM) at the point of maximum exposure. DPM is the exhaust emission from diesel construction equipment. The SCREEN3 dispersion model can be used to determine the concentration for air pollutants at any location near the pollutant generator. Additionally, the model will predict the maximum exposure distance and concentration. The SCREEN3 input/output files are shown in ***Attachment B*** of this report. The worst case exhaust emissions generated from the Project from construction equipment was utilized and calculated within the URBEMIS2007 model. The worst case cancer risk if exposed to a DPM dose for 70 years is defined as:

$$CR_{DPM} = C_{DPM} \times URF_{DPM}$$

Where, CR_{DPM} = Cancer risk from diesel particulate matter (DPM) (probability on an individual developing Cancer

C_{DPM} = Annual average DPM concentration in µg/m3

URF_{DPM} = Unit risk factor is .0003 per continuous exposure of 1 $\mu g/m^3$ of DPM over 70-year period per person)

(Source: Health Risk Assessment Guidance for Analyzing Cancer Risks from Mobile Source Diesel Idling emissions for CEQA Air Quality Analysis (August 2003))

3.2 Construction Assumptions

The entire Project site would be grubbed, graded and compacted in approximately one month trenching complete in roughly one month and total construction of the proposed project will be completed in approximately 6 months from start to finish. This assumption also includes all work necessary to provide onsite access roads and

the necessary work for setting and installing the photovoltaic panels, which were assumed in the Building Construction component of the project. Table 3.1 below shows the expected timeframes for the construction process at the Project location Table 3.1 also shows more construction equipment than is anticipated to be needed during site preparation and installation. This list was analyzed to be overly conservative and provide a worse case assessment.

Table 3.1: Expected Construction Equipment and Durations

Equipment Identification	Proposed Dates	Quantity	Hours per day
Mass Site Grading	1/01/2012 – 2/1/2012		
Graders		5	8
Tractors/loaders/Backhoes		4	8
Water Trucks		4	8
Dozers		3	8
Trenching	2/2/2012 – 2/27/2012		
Tractors/loaders/Backhoes		5	8
Trenchers		2	8
Water Trucks		1	8
Building Construction	2/28/2012 – 5/15/2012		
Bore/Drill Rig		2	8
Cranes		2	8
Air Compressor		1	8
Forklifts		1	8
Generator		1	8
Welders		3	8

This equipment list is based upon equipment inventory within URBEMIS2007. The quantity and types are based upon assumptions from projects of similar size and scope.

3.3 Operational Impacts

Operations of the project would involve washing the panels and various maintenance activities onsite. These operations can generate dust onsite from onsite service roads. Therefore, the project would install permeable rock on all access roads to reduce dust. A worst case trip generation would be less than 25 daily trips and would only occur at this intensity during PV system maintenance. Therefore,

Operational emissions would not be expected to exceed county screening thresholds.

Additionally, as part of the design, all disturbed areas would be covered with gravel or a permeable soil binding agent to reduce dust once the project is constructed and operational. The binding agent would be a non-toxic, biodegradable agent. Permeable rock material (gravel) will be applied to all on site roadways.

4.0 FINDINGS

4.1 Construction Findings

Air quality impacts related to construction will be calculated using the latest URBEMIS2007 air quality model, which was developed by ARB. URBEMIS2007 has been approved by SDAQMD and the County for construction emission calculations. URBEMIS incorporates emission factors from the EMFAC2007 model for on-road vehicle emissions and the OFFROAD2007 model for off-road vehicle emissions.

Construction analysis for the Project assumes that the contractor will utilize equipment in compliance with SDAPCD T/BACT requirements. The entire Project site would be grubbed, graded and compacted in approximately one month trenching complete in roughly one month and total construction of the proposed project will be completed in approximately 6 months from start to finish. Additionally, this model accounts for the construction of all onsite access roads which would be part of the onsite grading operation. A summary of the construction emissions is shown in Table 4.1 below and the URBEMIS model outputs are provided as ***Attachment A*** of this report. Given these findings, PM10 emissions would exceed SDAPCD air quality standard of 100 lbs/day and would require mitigation to comply.

Table 4.1: Expected Construction Emissions Summary

Year	ROG	NO_x	CO	SO_2	PM_{10} (Dust)	PM_{10} (Exhaust)	PM_{10} (Total)	$PM_{2.5}$ (Dust)	$PM_{2.5}$ (Exhaust)	$PM_{2.5}$ (Total)
2012 (lb/day) Unmitigated	12.77	102.03	58.66	0	160.02	5.15	165.17	33.42	4.73	38.15
Significance Threshold (lb/day)	75	250	550	250	-	-	100	-	-	55
SDAPCD Impact?	No	No	No	No	-	-	**Yes**	-	-	No
2012(lb/day) Mitigated	12.77	102.03	58.66	0	78.42	5.15	83.57	16.38	4.73	21.11
SDAPCD Impact?	No	No	No	No	-	-	No	-	-	No

It was found that the following mitigation measures would be required to reduce PM10 impacts to a level below significance:

1. *Apply water during grading/grubbing activities to all active disturbed areas and onsite roadways at least twice daily.*

The above mitigation recommendations are based on control efficiencies established by SCAQMD CEQA air quality handbook and recommended within the URBEMIS 2007 air quality model. The CEQA handbook states that watering twice daily can reduce PM10 from 34-68% however; an average 51% was utilized to determine compliance.

Furthermore, no additional projects are expected in the near vicinity of the proposed project so no additional cumulative emissions are expected. Therefore, no cumulative impacts would be created by the project.

4.2 Health Risk

Based upon this air quality modeling, we find that worst-case PM_{10} from exhaust could be as high 5.15 lbs per construction day (8-hours) or 0.0810 grams per second DPM during the construction day. Averaging this emission rate over the Project site area gives us the average emission rate for the Project area. Converting pounds (lbs) per day to grams per second is shown below:

$$\frac{5.15\frac{lb}{day}*453\frac{grams}{lb}}{28{,}800\frac{\text{sec}onds}{Constructionday}}=0.0810\frac{grams}{\text{sec}ond}$$

The average emission rate over the grading area is $4.17\text{x}10^{-7}$ g/m^2/s, which was calculated as follows:

$$\frac{0.0810\frac{grams}{\text{sec}ond}}{48acres*4{,}046\frac{meters^2}{acre}}=4.17*10^{-7}\frac{\frac{grams}{meters^2}}{\text{sec}ond}$$

Utilizing the SCREEN3 dispersion model, we find that the peak maximum 1-hr concentration is 31.54 µg/m^3 during grading at a distance of roughly 323 meters from the centroid of the Project site. This concentration would be lowered at any other distance from the project site. Utilizing the risk equation identified in Chapter 3 we calculate that the cancer risk over a 70-year continuous dose would be:

$$CR_{DPM\text{-}70yr\ dose} = 0.0003 \times 31.54 = 9.46 \times 10^{-3}$$

Based on these calculations, The Project is expected to generate maximum DPM during grading of the project, which is expected to take approximately one month with workdays of eight hours per day during a typical five-day week. If we assume the worst-case hourly emissions are produced every hour, and averaging this out over a 70 year period and breaking it out into 24 hour days would yield 7.6-24 hr days over 70 years (or 25,550 days) or 7.6/25,550 or (2.975×10^{-4}) times the CR_{DPM}. If one million people were exposed to the maximum DPM for the duration of grading at 323 meters from the project site, the estimated increased cancer risk could be:

$$9.46 \times 10^{-3} \times 2.975 \times 10^{-4} \times 1{,}000{,}000 = 2.814 \text{ individuals per million}$$

Therefore, because the project increases the risk to more than one person per million the project would be required to utilize equipment meeting requirements of T-BACT such as using diesel particulate filters, catalytic converters and or selective catalytic reduction technologies. Also, it should be noted that every receptor outside of the 323 meter radius from the project would have a risk level lower than 2.814 individuals per 1 million exposed. The SCREEN3 dispersion model outputs are provided as ***Attachment B*** to this report.

Furthermore, no additional projects are expected in the near vicinity of the project and would not cumulatively contribute any additional DPM emissions and would therefore not have a cumulative impact.

4.3 Regional Impacts

The proposed project would create a 2.5 MW renewable energy source within the alpine and would not therefore create impacts to the purpose of the RAQS. In fact

given that the energy source does not create ozone precursors, could arguable reduce O_3, which would be acceptable and desirable under the RAQS.

4.4 Odor Impact Findings

The proposed project would not create operational odors. Therefore, no significant odor impacts are expected from the proposed project.

4.5 Conclusion of Findings

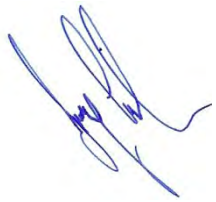
Based upon our analysis of construction activities for the proposed Valley Center PV Solar Project, PM_{10} impacts are expected during the construction phase of the Project and mitigation will be required. The following mitigation requirements must be implemented for construction related impacts to be considered less than significant:

1. Apply water during grading/grubbing activities to all active disturbed areas and onsite roadways at least twice daily.

A screening-level health risk assessment was conducted to determine the potential for the project to result in a significant impact on nearby sensitive receptors during short-term construction activities. The result of the health risk assessment indicates that the proposed project could result in a health risk impact to either existing or future sensitive receptors should sensitive receptors be at or around 323 Meters from the geometric center of the project. This potential impact can be mitigated through the use of T-BACT equipment or equipment such as diesel particulate filters, catalytic converters and or a combination of DPM reducing equipment and selective emission reduction fuels. Therefore no health risk impacts are anticipated.

5.0 CERTIFICATIONS

The contents of this report represent an accurate depiction of the air quality environment and impacts within and surrounding the Sol Orchard - Valley Center Solar Project. The report was prepared by Jeremy Louden; a County approved CEQA Consultant for Air Quality.



Jeremy Louden, Principal
Ldn Consulting, Inc.
760-473-1253
jlouden@ldnconsulting.net

Date October 20, 2011

ATTACHMENT A

URBEMIS 2007

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Urbemis 2007 Version 9.2.4

Combined Summer Emissions Reports (Pounds/Day)

File Name: C:\Jeremy 7-11-11\Rosendin Solar Valley Center\Rosendin.urb924

Project Name: Rosendin Solar Project

Project Location: California State-wide

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2012 TOTALS (lbs/day unmitigated)	12.77	102.03	58.66	0.00	160.02	5.15	165.17	33.42	4.73	38.15	10,859.78
2012 TOTALS (lbs/day mitigated)	12.77	102.03	58.66	0.00	78.42	5.15	83.57	16.38	4.73	21.11	10,859.78

Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Summer Pounds Per Day, Unmitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2

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Time Slice 1/2/2012-2/1/2012 Active Days: 23	**12.77**	**102.03**	**58.66**	**0.00**	**160.02**	**5.15**	**165.17**	**33.42**	**4.73**	**38.15**	**10,859.78**
Mass Grading 01/01/2012-02/01/2012	12.77	102.03	58.66	0.00	160.02	5.15	165.17	33.42	4.73	38.15	10,859.78
Mass Grading Dust	0.00	0.00	0.00	0.00	160.00	0.00	160.00	33.41	0.00	33.41	0.00
Mass Grading Off Road Diesel	12.65	101.83	54.88	0.00	0.00	5.14	5.14	0.00	4.72	4.72	10,450.88
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.12	0.20	3.78	0.00	0.02	0.01	0.03	0.01	0.01	0.02	408.90
Time Slice 2/2/2012-2/27/2012 Active Days: 18	4.43	29.07	19.60	0.00	0.01	2.30	2.31	0.00	2.11	2.12	3,092.03
Trenching 02/02/2012-02/27/2012	4.43	29.07	19.60	0.00	0.01	2.30	2.31	0.00	2.11	2.12	3,092.03
Trenching Off Road Diesel	4.37	28.96	17.71	0.00	0.00	2.29	2.29	0.00	2.11	2.11	2,887.58
Trenching Worker Trips	0.06	0.10	1.89	0.00	0.01	0.01	0.02	0.00	0.00	0.01	204.45
Time Slice 2/28/2012-5/30/2012 Active Days: 67	5.33	35.62	18.34	0.00	0.00	1.75	1.75	0.00	1.61	1.61	5,678.78
Building 02/28/2012-05/30/2012	5.33	35.62	18.34	0.00	0.00	1.75	1.75	0.00	1.61	1.61	5,678.78
Building Off Road Diesel	5.33	35.62	18.34	0.00	0.00	1.75	1.75	0.00	1.61	1.61	5,678.78
Building Vendor Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Building Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Phase Assumptions

Phase: Mass Grading 1/1/2012 - 2/1/2012 - Grubbing and Mass Grading

Total Acres Disturbed: 48

Maximum Daily Acreage Disturbed: 8

Fugitive Dust Level of Detail: Default

20 lbs per acre-day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

5 Graders (174 hp) operating at a 0.61 load factor for 8 hours per day

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3 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 8 hours per day

4 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 8 hours per day

4 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Trenching 2/2/2012 - 2/27/2012 - trenching

Off-Road Equipment:

5 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 8 hours per day

2 Trenchers (63 hp) operating at a 0.75 load factor for 8 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Building Construction 2/28/2012 - 5/30/2012 - Construction of PV systems

Off-Road Equipment:

1 Air Compressors (106 hp) operating at a 0.48 load factor for 8 hours per day

2 Bore/Drill Rigs (291 hp) operating at a 0.75 load factor for 8 hours per day

2 Cranes (399 hp) operating at a 0.43 load factor for 8 hours per day

1 Forklifts (145 hp) operating at a 0.3 load factor for 8 hours per day

1 Generator Sets (49 hp) operating at a 0.74 load factor for 8 hours per day

3 Welders (45 hp) operating at a 0.45 load factor for 8 hours per day

Construction Mitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Summer Pounds Per Day, Mitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2

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Time Slice 1/2/2012-2/1/2012 Active Days: 23	**12.77**	**102.03**	**58.66**	**0.00**	78.42	**5.15**	83.57	16.38	**4.73**	21.11	**10,859.78**
Mass Grading 01/01/2012-02/01/2012	12.77	102.03	58.66	0.00	78.42	5.15	83.57	16.38	4.73	21.11	10,859.78
Mass Grading Dust	0.00	0.00	0.00	0.00	78.40	0.00	78.40	16.37	0.00	16.37	0.00
Mass Grading Off Road Diesel	12.65	101.83	54.88	0.00	0.00	5.14	5.14	0.00	4.72	4.72	10,450.88
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.12	0.20	3.78	0.00	0.02	0.01	0.03	0.01	0.01	0.02	408.90
Time Slice 2/2/2012-2/27/2012 Active Days: 18	4.43	29.07	19.60	0.00	0.01	2.30	2.31	0.00	2.11	2.12	3,092.03
Trenching 02/02/2012-02/27/2012	4.43	29.07	19.60	0.00	0.01	2.30	2.31	0.00	2.11	2.12	3,092.03
Trenching Off Road Diesel	4.37	28.96	17.71	0.00	0.00	2.29	2.29	0.00	2.11	2.11	2,887.58
Trenching Worker Trips	0.06	0.10	1.89	0.00	0.01	0.01	0.02	0.00	0.00	0.01	204.45
Time Slice 2/28/2012-5/30/2012 Active Days: 67	5.33	35.62	18.34	0.00	0.00	1.75	1.75	0.00	1.61	1.61	5,678.78
Building 02/28/2012-05/30/2012	5.33	35.62	18.34	0.00	0.00	1.75	1.75	0.00	1.61	1.61	5,678.78
Building Off Road Diesel	5.33	35.62	18.34	0.00	0.00	1.75	1.75	0.00	1.61	1.61	5,678.78
Building Vendor Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Building Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Construction Related Mitigation Measures

The following mitigation measures apply to Phase: Mass Grading 1/1/2012 - 2/1/2012 - Grubbing and Mass Grading

For Soil Stablizing Measures, the Water exposed surfaces 2x daily watering mitigation reduces emissions by:

PM10: 51% PM25: 51%

For Unpaved Roads Measures, the Manage haul road dust 2x daily watering mitigation reduces emissions by:

PM10: 51% PM25: 51%

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Urbemis 2007 Version 9.2.4

Combined Winter Emissions Reports (Pounds/Day)

File Name: C:\Jeremy 7-11-11\Rosendin Solar Valley Center\Rosendin.urb924

Project Name: Rosendin Solar Project

Project Location: California State-wide

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2012 TOTALS (lbs/day unmitigated)	12.77	102.03	58.66	0.00	160.02	5.15	165.17	33.42	4.73	38.15	10,859.78
2012 TOTALS (lbs/day mitigated)	12.77	102.03	58.66	0.00	78.42	5.15	83.57	16.38	4.73	21.11	10,859.78

Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Winter Pounds Per Day, Unmitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2

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Time Slice 1/2/2012-2/1/2012 Active Days: 23	**12.77**	**102.03**	**58.66**	**0.00**	**160.02**	**5.15**	**165.17**	**33.42**	**4.73**	**38.15**	**10,859.78**
Mass Grading 01/01/2012-02/01/2012	12.77	102.03	58.66	0.00	160.02	5.15	165.17	33.42	4.73	38.15	10,859.78
Mass Grading Dust	0.00	0.00	0.00	0.00	160.00	0.00	160.00	33.41	0.00	33.41	0.00
Mass Grading Off Road Diesel	12.65	101.83	54.88	0.00	0.00	5.14	5.14	0.00	4.72	4.72	10,450.88
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.12	0.20	3.78	0.00	0.02	0.01	0.03	0.01	0.01	0.02	408.90
Time Slice 2/2/2012-2/27/2012 Active Days: 18	4.43	29.07	19.60	0.00	0.01	2.30	2.31	0.00	2.11	2.12	3,092.03
Trenching 02/02/2012-02/27/2012	4.43	29.07	19.60	0.00	0.01	2.30	2.31	0.00	2.11	2.12	3,092.03
Trenching Off Road Diesel	4.37	28.96	17.71	0.00	0.00	2.29	2.29	0.00	2.11	2.11	2,887.58
Trenching Worker Trips	0.06	0.10	1.89	0.00	0.01	0.01	0.02	0.00	0.00	0.01	204.45
Time Slice 2/28/2012-5/30/2012 Active Days: 67	5.33	35.62	18.34	0.00	0.00	1.75	1.75	0.00	1.61	1.61	5,678.78
Building 02/28/2012-05/30/2012	5.33	35.62	18.34	0.00	0.00	1.75	1.75	0.00	1.61	1.61	5,678.78
Building Off Road Diesel	5.33	35.62	18.34	0.00	0.00	1.75	1.75	0.00	1.61	1.61	5,678.78
Building Vendor Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Building Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Phase Assumptions

Phase: Mass Grading 1/1/2012 - 2/1/2012 - Grubbing and Mass Grading

Total Acres Disturbed: 48

Maximum Daily Acreage Disturbed: 8

Fugitive Dust Level of Detail: Default

20 lbs per acre-day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

5 Graders (174 hp) operating at a 0.61 load factor for 8 hours per day

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3 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 8 hours per day

4 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 8 hours per day

4 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Trenching 2/2/2012 - 2/27/2012 - trenching

Off-Road Equipment:

5 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 8 hours per day

2 Trenchers (63 hp) operating at a 0.75 load factor for 8 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Building Construction 2/28/2012 - 5/30/2012 - Construction of PV systems

Off-Road Equipment:

1 Air Compressors (106 hp) operating at a 0.48 load factor for 8 hours per day

2 Bore/Drill Rigs (291 hp) operating at a 0.75 load factor for 8 hours per day

2 Cranes (399 hp) operating at a 0.43 load factor for 8 hours per day

1 Forklifts (145 hp) operating at a 0.3 load factor for 8 hours per day

1 Generator Sets (49 hp) operating at a 0.74 load factor for 8 hours per day

3 Welders (45 hp) operating at a 0.45 load factor for 8 hours per day

Construction Mitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Winter Pounds Per Day, Mitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2

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Time Slice 1/2/2012-2/1/2012 Active Days: 23	**12.77**	**102.03**	**58.66**	**0.00**	78.42	**5.15**	83.57	16.38	**4.73**	21.11	**10,859.78**
Mass Grading 01/01/2012-02/01/2012	12.77	102.03	58.66	0.00	78.42	5.15	83.57	16.38	4.73	21.11	10,859.78
Mass Grading Dust	0.00	0.00	0.00	0.00	78.40	0.00	78.40	16.37	0.00	16.37	0.00
Mass Grading Off Road Diesel	12.65	101.83	54.88	0.00	0.00	5.14	5.14	0.00	4.72	4.72	10,450.88
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.12	0.20	3.78	0.00	0.02	0.01	0.03	0.01	0.01	0.02	408.90
Time Slice 2/2/2012-2/27/2012 Active Days: 18	4.43	29.07	19.60	0.00	0.01	2.30	2.31	0.00	2.11	2.12	3,092.03
Trenching 02/02/2012-02/27/2012	4.43	29.07	19.60	0.00	0.01	2.30	2.31	0.00	2.11	2.12	3,092.03
Trenching Off Road Diesel	4.37	28.96	17.71	0.00	0.00	2.29	2.29	0.00	2.11	2.11	2,887.58
Trenching Worker Trips	0.06	0.10	1.89	0.00	0.01	0.01	0.02	0.00	0.00	0.01	204.45
Time Slice 2/28/2012-5/30/2012 Active Days: 67	5.33	35.62	18.34	0.00	0.00	1.75	1.75	0.00	1.61	1.61	5,678.78
Building 02/28/2012-05/30/2012	5.33	35.62	18.34	0.00	0.00	1.75	1.75	0.00	1.61	1.61	5,678.78
Building Off Road Diesel	5.33	35.62	18.34	0.00	0.00	1.75	1.75	0.00	1.61	1.61	5,678.78
Building Vendor Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Building Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Construction Related Mitigation Measures

The following mitigation measures apply to Phase: Mass Grading 1/1/2012 - 2/1/2012 - Grubbing and Mass Grading

For Soil Stablizing Measures, the Water exposed surfaces 2x daily watering mitigation reduces emissions by:

PM10: 51% PM25: 51%

For Unpaved Roads Measures, the Manage haul road dust 2x daily watering mitigation reduces emissions by:

PM10: 51% PM25: 51%

ATTACHMENT B

SCREEN 3

```
 ***  SCREEN3 MODEL RUN  ***
 *** VERSION DATED 96043 ***

Rosendin PV

SIMPLE TERRAIN INPUTS:
   SOURCE TYPE                =          AREA
   EMISSION RATE (G/(S-M**2))  =      .417000E-06
   SOURCE HEIGHT (M)          =        3.0000
   LENGTH OF LARGER SIDE (M)   =      440.0000
   LENGTH OF SMALLER SIDE (M)  =      440.0000
   RECEPTOR HEIGHT (M)        =        2.0000
   URBAN/RURAL OPTION         =         RURAL
THE REGULATORY (DEFAULT) MIXING HEIGHT OPTION WAS SELECTED.
THE REGULATORY (DEFAULT) ANEMOMETER HEIGHT OF 10.0 METERS WAS ENTERED.

   MODEL ESTIMATES DIRECTION TO MAX CONCENTRATION


BUOY. FLUX =      .000 M**4/S**3;  MOM. FLUX =      .000 M**4/S**2.

*** FULL METEOROLOGY ***

**********************************
*** SCREEN AUTOMATED DISTANCES ***
**********************************

*** TERRAIN HEIGHT OF    0. M ABOVE STACK BASE USED FOR FOLLOWING DISTANCES ***

  DIST     CONC                 U10M   USTK  MIX HT   PLUME  MAX DIR
   (M)   (UG/M**3)   STAB   (M/S)  (M/S)    (M)   HT (M)   (DEG)
-------  ----------  ----  -----  -----  ------  ------  -------
    10.   19.98        6     1.0    1.0 10000.0    3.00     45.
   100.   24.16        6     1.0    1.0 10000.0    3.00     45.
   200.   28.13        6     1.0    1.0 10000.0    3.00     45.
   300.   31.00        6     1.0    1.0 10000.0    3.00     45.
   400.   27.08        6     1.0    1.0 10000.0    3.00     45.
   500.   23.01        6     1.0    1.0 10000.0    3.00     45.
   600.   19.97        6     1.0    1.0 10000.0    3.00     45.
   700.   17.67        6     1.0    1.0 10000.0    3.00     45.
   800.   15.90        6     1.0    1.0 10000.0    3.00     45.
   900.   14.51        6     1.0    1.0 10000.0    3.00     45.
  1000.   13.40        6     1.0    1.0 10000.0    3.00     45.
  1100.   12.49        6     1.0    1.0 10000.0    3.00     45.
  1200.   11.71        6     1.0    1.0 10000.0    3.00     45.
  1300.   11.04        6     1.0    1.0 10000.0    3.00     45.
  1400.   10.45        6     1.0    1.0 10000.0    3.00     45.
  1500.   9.926        6     1.0    1.0 10000.0    3.00     45.
  1600.   9.452        6     1.0    1.0 10000.0    3.00     45.
  1700.   9.022        6     1.0    1.0 10000.0    3.00     45.
  1800.   8.632        6     1.0    1.0 10000.0    3.00     45.
  1900.   8.279        6     1.0    1.0 10000.0    3.00     45.
  2000.   7.960        6     1.0    1.0 10000.0    3.00     45.
  2100.   7.670        6     1.0    1.0 10000.0    3.00     45.
  2200.   7.406        6     1.0    1.0 10000.0    3.00     45.
  2300.   7.165        6     1.0    1.0 10000.0    3.00     45.
  2400.   6.940        6     1.0    1.0 10000.0    3.00     45.
  2500.   6.728        6     1.0    1.0 10000.0    3.00     45.
  2600.   6.528        6     1.0    1.0 10000.0    3.00     45.
  2700.   6.339        6     1.0    1.0 10000.0    3.00     45.
  2800.   6.159        6     1.0    1.0 10000.0    3.00     45.
```

2900.	5.992	6	1.0	1.0	10000.0	3.00	45.
3000.	5.835	6	1.0	1.0	10000.0	3.00	45.
3500.	5.177	6	1.0	1.0	10000.0	3.00	45.
4000.	4.642	6	1.0	1.0	10000.0	3.00	45.
4500.	4.190	6	1.0	1.0	10000.0	3.00	45.
5000.	3.805	6	1.0	1.0	10000.0	3.00	45.
5500.	3.473	6	1.0	1.0	10000.0	3.00	45.
6000.	3.184	6	1.0	1.0	10000.0	3.00	45.
6500.	2.931	6	1.0	1.0	10000.0	3.00	45.
7000.	2.711	6	1.0	1.0	10000.0	3.00	45.
7500.	2.522	6	1.0	1.0	10000.0	3.00	44.
8000.	2.355	6	1.0	1.0	10000.0	3.00	44.
8500.	2.206	6	1.0	1.0	10000.0	3.00	44.
9000.	2.072	6	1.0	1.0	10000.0	3.00	45.
9500.	1.950	6	1.0	1.0	10000.0	3.00	42.
10000.	1.841	6	1.0	1.0	10000.0	3.00	43.

MAXIMUM 1-HR CONCENTRATION AT OR BEYOND 10. M:

323.	31.54	6	1.0	1.0	10000.0	3.00	45.

****
*** SUMMARY OF SCREEN MODEL RESULTS ***
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CALCULATION PROCEDURE	MAX CONC (UG/M**3)	DIST TO MAX (M)	TERRAIN HT (M)
SIMPLE TERRAIN	31.54	323.	0.

****
** REMEMBER TO INCLUDE BACKGROUND CONCENTRATIONS **
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